

WHAT IS CLAIMED IS:

1. An O₂-sensor fault diagnosis apparatus comprising:

an O₂-sensor for detecting concentration of oxygen contained in an exhaust gas of an internal combustion engine;

a feedback control portion for controlling a quantity of fuel supplied to the internal combustion engine through feedback control according to an output signal of the O₂-sensor;

a state judging portion for judging whether the O₂-sensor is in an active state or in an inactive state on the basis of an voltage of the output signal of the O₂-sensor; and

a fault diagnosis portion for diagnosing whether the O₂-sensor has any fault on the basis of the voltage of the output signal of the O₂-sensor under a condition where it is judged that the O₂-sensor is in the inactive state.

2. The O₂-sensor fault diagnosis apparatus according to Claim 1, wherein said fault diagnosis portion includes an input resistance changing portion for changing an input resistance so as to cause a change in a level of the output signal of said O₂-sensor, and identifies a fault of said O₂-sensor on the basis of the change in the level of the output signal caused by changing the input resistance.

3. The O₂-sensor fault diagnosis apparatus according to Claim 1,

wherein said fault diagnosis portion diagnoses whether said O₂-sensor has any fault each time said state judging portion judges that said O₂-sensor is in the inactive state.

4. The O₂-sensor fault diagnosis apparatus according to Claim 1 further comprising an informing portion for sending a notice if said fault diagnosis portion diagnoses that said O₂-sensor has a fault.

5. An O₂-sensor fault diagnosis method comprising:

a state judging step for judging whether an O₂-sensor, which detects concentration of oxygen contained in an exhaust gas of an internal combustion engine, is in an active state or in an inactive state on the basis of an voltage of an output signal of the O₂-sensor; and

a fault diagnosis step for diagnosing whether the O₂-sensor has any fault on the basis of the voltage of the output signal of the O₂-sensor under a condition where it is judged that the O₂-sensor is in the inactive state.

6. The O₂-sensor fault diagnosis method according to Claim 5, wherein in said fault diagnosis step, a fault of the O₂-sensor is identified on the basis of a change in a level of the output signal of the O₂-sensor caused by changing an input resistance.

7. The O₂-sensor fault diagnosis method according to Claim 5, wherein

in said fault diagnosis step, it is diagnosed whether the O₂-sensor has any fault each time it is judged in the state judging step that the O₂-sensor is in the inactive state.

8. The O₂-sensor fault diagnosis method according to Claim 5 further comprising an informing step for sending a notice if the O₂-sensor is diagnosed to have a fault in said fault diagnosis step.